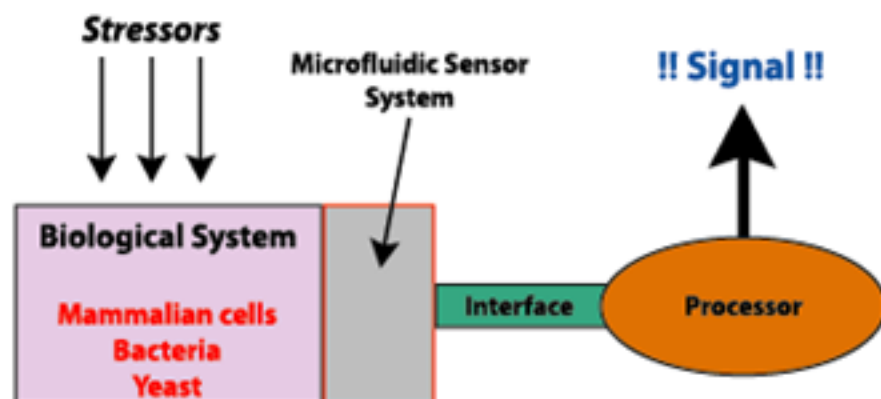


:: BIOSENTINEL SYSTEMS ::

BIOLOGY-BASED MICROFLUIDIC REPORTER TECHNOLOGY FOR MONITORING ENVIRONMENTAL STRESSORS

■ Overview



■ Description

The advanced biosentinel system is comprised of living reporter systems. Micro- and nano-technologies and informatics provide sensing capability and effector functions in complex multi-stressor space environments.

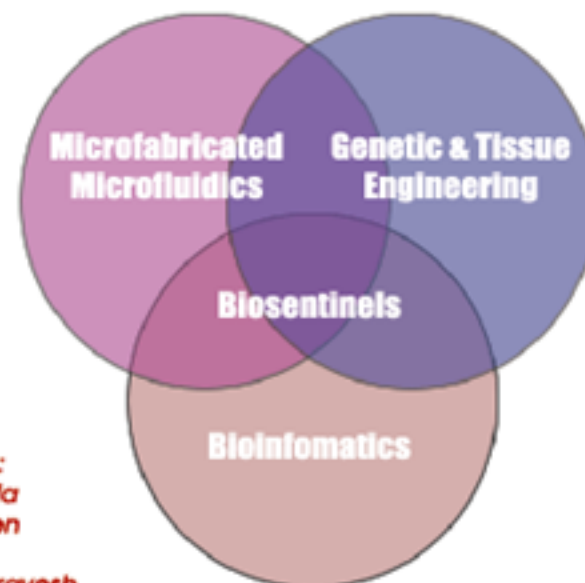
The Biosentinel System:

- Provides sensing capability for a wide range of environmental stressors including various types of radiation, chemicals and gases
- Is capable of providing a sophisticated and rapid bioanalytical response
- A benchmark for living systems as reporters will advance our understanding of the synergistic effects of multiple stressors on life in complex environments
- Will cause significant benefits to be realized in savings of power, space, fluids and waste

■ NASA Significance

Space offers new challenges to all life as we understand it from Earth. Our exploration of space, the solar system and beyond will invoke novel combinations of stressors and selective pressures that will affect all life that has originated from this planet. Therefore it is imperative that we initiate ordered investigations of the response of reference terrestrial life forms to adverse extraterrestrial environments. The proposed probe systems should serve as an adjunct to physical measurements of the environmental factors. The cell based probes add the dimension of relevance to life and moreover provide an assessment of the combinatorial outcome from numerous simultaneous environmental factors. This can be achieved by packaging closed biological systems interfaced with micro- and nano-analytical strategies. Multiple events can be probed at both the genetic and molecular level, enabling a complete assessment of the alterations in the regulatory genetic and molecular pathways associated with the normal and altered growth of prokaryotic and eukaryotic cells and tissues due to space and planetary environmental stressors.

■ Project Interactions



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